

REMARKS

Reconsideration and withdrawal of the rejections set forth in the above-mentioned Office Action in view of the foregoing amendments and the following remarks are respectfully requested.

Claims 1-3, 5-10 and 12 are now pending in this application, with Claim 1 being the sole independent claim. Claims 11 and 13 have been cancelled without prejudice or disclaimer. Claims 1, 10 and 12 have been amended Herein. In particular, the features of Claim 11 have been incorporated into Claim 1. Support for the feature of a diglyme solvent can be found in the specification at page 44, lines 13-14 and the features of xylene and methyl isobutyl ketone can be found at page 21, line 11. Of course, the claims are not intended to be limited in scope to these preferred embodiments.

Claims 10, 12 and 13 were rejected under 35 U.S.C. § 112, first paragraph, as allegedly failing to comply with the written description requirement. The Office Action suggests that the terms “positive type resist composite” and “positive type photosensitive material” are not the same in that there is no description in the specification of a positive type photosensitive composite being associated with a heating temperature. While Applicants have not suggested that the two terms in question are necessarily equivalent, there is clear support for the terms used in the claims. At pages 12 and 13, a copolymer of the photosensitive material is described. At page 13, lines 10-15, it is described that the copolymer is not limited “so long as a desired

characteristic of a positive type resist is obtained.” Moreover, resist layers are described in the specification as being photosensitive or photodegradable. Note page 44, lines 24-26.

Accordingly, Applicants respectively submit that usage of the term “positive type photosensitive material” in the claims is adequately described and supported in the specification.

In view of the foregoing, reconsideration and withdrawal of the § 112, first paragraph, rejections are requested.

Claims 1-3 and 5-9 were rejected under 35 U.S.C. § 103(a) as being obvious over European Patent Application No. 1 380 422 (Kubota et al. ‘422) in view of U.S. Patent Application Publication No. 2004/0214945 (Uozumi). Claim 10 was rejected under 35 U.S.C. § 103(a) as being obvious over Kubota et al. ‘422 in view of Uozumi, and further in view of U.S. Patent No. 5,523,383 (Ikeda et al.). Claims 11-13 were rejected under 35 U.S.C. § 103(a) as being obvious over Kubota et al. ‘422 in view of Uozumi, and further in view of U.S. Patent Application Publication No. 2004/0072107 (Kubota et al. ‘107). These rejections are respectfully traversed.

As recited in independent Claim 1, the present invention relates to a method for manufacturing a liquid discharge head including a substrate, on which is arranged an energy generating element to generate energy used to discharge liquid from a discharge port, and a flow path communicating with the energy generating element and the discharge port. The method includes the steps of providing a positive type photosensitive material layer containing a copolymer of methacrylic acid and methacrylate ester on the substrate in a diglyme solvent,

forming a solid layer for forming the flow path from the positive type photosensitive material layer on the substrate, and forming, on the substrate where the solid layer is formed, a coating resin layer for coating the solid layer. The method further includes the steps of forming the discharge port through a photolithographic process, in the coating resin layer formed on the solid layer, and removing the solid layer to form the flow path. A material used for the coating resin layer contains a cationically polymerizable resin and a basic material having a pair of nonshared electrons containing xylene and methyl isobutyl ketone. The material of the solid layer that forms a boundary with a portion where the discharge port of the coating resin layer is formed contains the copolymer of methacrylic acid and methacrylate ester.

In the claimed method, the diglyme solvent can be used to dissolve the resin for forming the solid layer and a mixed solvent of xylene and methyl isobutyl ketone can be used to dissolve the coating layer. Applicants submit that solvent may remain in the solid layer after the solid layer is formed. If the solvent of the coating layer has compatibility with the solvent remaining in the solid layer, a compatible layer may be generated, which can cause scum to be formed. The compatibility can be reduced by using the diglyme solvent and the solvent of xylene and methyl isobutyl ketone, which, in turn, can control the formation of the scum.

In Kubota et al. '422, a liquid jet recording head is formed including a substrate on which energy generating elements 202 are arranged. The substrate is coated with a cross linking positive resist layer 203, which includes a copolymer of methacrylate and methacrylate acid. A PMIPK positive resist layer 204 is coated on resist layer 203 and exposed using deep UV

exposure. Applicants submit that in Kubota et al. '422 the acryl copolymer (the solid layer) is dissolved in cyclohexanone (note column 17, lines 4-6, for example), and the coating layer is dissolved in methyl isobutyl ketone. Both cyclohexanone and methyl isobutyl ketone are ketone solvents. Accordingly, Kubota et al. '422 fails to disclose or suggest at least providing a positive type photosensitive material layer containing a copolymer of methacrylic acid and methacrylate ester on the substrate in a diglyme solvent, and that a material used for the coating resin layer contains a cationically polymerizable resin and a basic material having a pair of nonshared electrons containing xylene and methyl isobutyl ketone, as is recited in independent Claim 1.

Thus, Kubota et al. '422 fails to disclose or suggest important features of the present invention recited in independent Claim 1.

Uozumi is directed to a cationically polymerizable composition and ink. However, Uozumi is not believed to remedy the deficiencies of Kubota et al. '422 noted above with respect to Claim 1. Moreover, the composition of Uozumi is usable in ink and one of ordinary skill in the art would not look to the components of Uozumi to modify the liquid discharge head of Kubota et al. '422.

The remaining citations have also been reviewed, but are not believed to be any more relevant than those discussed above.

Thus, Claim 1 is patentable over the citations of record. Reconsideration and withdrawal of the § 103 rejections are requested.

For the foregoing reasons, Applicants respectfully submit that the present

invention is patentably defined by independent Claim 1. Dependent Claims 2, 3, 5-10 and 12 are also allowable, in their own right, for defining features of the present invention in addition to those recited in independent Claim 1. Individual consideration of the dependent claims is requested.

Applicants respectfully submit that the application is in condition for allowance. Favorable reconsideration, withdrawal of the rejections set forth in the above-noted Office Action, and an early Notice of Allowability are requested.

Applicants' undersigned attorney may be reached in our Washington, D.C. office by telephone at (202) 530-1010. All correspondence should continue to be directed to our below-listed address.

Respectfully submitted,

/Mark A. Williamson/

Mark A. Williamson
Attorney for Applicants
Registration No. 33,628

FITZPATRICK, CELLA, HARPER & SCINTO
1290 Avenue of the Americas
New York, New York 10104-3800
Facsimile: (212) 218-2200

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